■ Two full-power USB 2.0 ports are broken out as standard, along with a USB OTG port near the Ethernet connector

■ The Cubieboard's stand-out feature is a SATA 2.0 connector, complete with 5V header and bundled power and data cable

■ A dual-core AllWinner A20 ARM Cortex-A7 gives the Cubieboard 2 a lot of power

■ With a total of 1GB of DDR3 RAM, it's clear the board is designed to outclass the Raspberry Pi

MINI PC

Cubieboard 2 £52.95 / $99

With a dual-core processor, SATA connectivity and plenty of GPIO, is the Cubieboard 2 the Raspberry Pi killer it is positioned to be?

Pros
The dual-core processor is powerful, and uses a recent enough instruction set architecture to boot nearly any ARM-compatible Linux distribution

Cons
The stock Android install is somewhat awkward to use and exhibits compatibility issues with certain apps from the Google Play market

The Cubieboard was originally introduced as a Raspberry Pi competitor in September 2012 as a limited production run. A follow-up design replaced the original AllWinner A10 processor with an AllWinner A20, a dual-core Cortex-A7 chip boasting dual Mali-400 graphics processors. Although launched mid-way through last year, the board has been hard to come by in the UK – an issue now resolved thanks to a distribution partnership between Cubieboard and low-power computing specialist New IT.

Unpacking the Cubieboard 2, it's easy to see how it improves on the Pi. With a near-identical footprint, the board packs in considerably more connectivity, including two USB 2.0 host and one USB 2.0 On-The-Go (OTG) ports, a 10/100Mb Ethernet connector, an on-board infra-red receiver, input and output jacks for analogue audio, an HDMI connector and, most impressively, a SATA 2.0 connector and 5V header capable of driving a 2.5-inch hard drive with transfer rates up to 3 GB/s.

Flipping the board over reveals a pair of dual-inline 48-pin male headers, playing host to the Cubieboard's GPIO connectivity and including everything from I2C and SPDIF digital audio to digital and analogue video outputs as an alternative to the on-board HDMI port.

There have been many would-be Pi competitors and they often have impressive feature lists but fall down on the software side. The Cubieboard initially impresses on this front, with a customised Android 4.2.2 build coming pre-loaded on the board's 4GB of NAND flash storage. Outputting at a full 1080p resolution, the Cubieboard's stock OS includes access to the Google Play store, a Miracast receiver, Adobe Flash support and other tweaks that suggest the board would make an excellent smart TV set-top box.

Sadly, there are some glitches to be found here. A large sub-set of the software available on Google Play won't install on the Cubieboard due to compatibility issues, while performance from the reasonably high-end Mali-400 graphics processors was extremely poor during our test.

Thankfully, there's plenty of support for alternative operating systems. The AllWinner A20 is an ARMv7 platform, a generation above the Raspberry Pi's ARMv6 BCM2835 chip, and as a result almost any ARM-compatible distribution can be convinced to boot on the Cubieboard. Some projects, most notably Fedora, even use Cubieboard hardware for testing their ARM editions prior to release.

Installing one of these distributions – we chose a Raspbian-inspired Debian port for the purpose of our review – transforms the Cubieboard and it's here the board really begins to shine. The dual-core processor is fantastic for keeping the system responsive while it's chugging away on background tasks, and has a dramatic impact on multi-threaded applications: the faster processor is capable of compressing a file with gzip in half the time required by the Pi, and this is then reduced to a mere quarter by using the multicore-aware pigz application to run the action across both CPU cores.

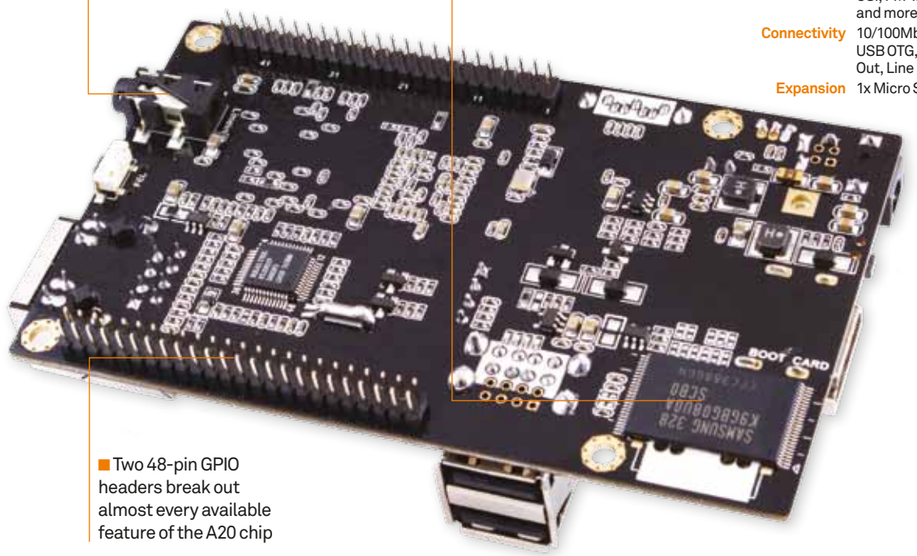
Using the Cubieboard as a general-purpose computer, then, is entirely possible: the performance is far closer to a normal desktop than the oft-sluggish Pi. Granted, the Cubieboard 2 is twice the price of the pocket-friendly Pi, but at roughly four times the real-world performance and with far more connectivity, that's an investment likely worth making.

Perhaps the only oddity of the Cubieboard is the location of the GPIO headers on the bottom, rather than the top, of the PCB. It takes some getting used to, but such a layout does help to keep wires out of sight in finished projects – especially when coupled with one of the many cases available for the board.

■ *Gareth Halfacree*

■ As well as analogue audio output, the Cubieboard 2 includes line-in, and SPDIF digital audio via the GPIO header

■ While the silkscreen suggests a second SD card slot, the Cubieboard 2 instead features a 4GB NAND flash module



■ Two 48-pin GPIO headers break out almost every available feature of the A20 chip

Technical specs

Operating System	Android 4.2.2 pre-loaded in NAND
Processor	AllWinner A20 dual-core ARM Cortex-A7 1GHz
Graphics	ARM Mali 400 MP2 dual-core graphics
Memory	1GB DDR3, 4GB NAND flash storage
Dimensions	104.5mm x 60.1mm x 24mm
Weight	47g (excluding cables)
GPIO	2x 48-pin headers on underside, featuring I2C, SPI, RGB/LVDS Video, CSI, FM-IN, ADC, VGA, SPDIF Out, R-TP and more
Connectivity	10/100Mb Ethernet, 2x USB Host, 1x USB OTG, IrDA Receiver, Headphones Out, Line In
Expansion	1x Micro SD, 1x SATA

Summary

Although the stock Android install hides its light under a bushel, the Cubieboard 2 is a very capable platform. Its processor is compatible with – and, in some cases, the test platform for – numerous Linux distributions and the ability to connect high-speed SATA storage is undeniably useful. For those who have outgrown the Pi, it's a logical upgrade.

Also consider

AOlimex A20-OLinuXino-Micro-4GB
€65 (around £55)
A fully open hardware design, the A20-OLinuXino-Micro is based on the same AllWinner A20 chip as the Cubieboard 2, but packs even more features with dual SD card slots, LCD connector, 160 GPIO pins across three connectors, and a noise-immune design suitable for industrial use.
olimex.com

Raspberry Pi
£30
The go-to choice for low-cost ARM-based development boards, the Pi is around half the price of the Cubieboard 2 but cuts corners accordingly: its single-core processor is no match for the AllWinner A20, its GPIO is minimal and simplified and there's no audio input or SATA connectivity as standard.
raspberrypi.org

More information
cubieboard.org